WHAT IS CLAIMED IS:

1. A communication system for communicating data packets, including a receiver subsystem, the receiver subsystem comprising:

a first antenna;

a second antenna;

a direct sequence spread-spectrum demodulator in communication with the first and second antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device responsive to the direct sequence spread-spectrum demodulator, the device being configured to measure signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code and to select one of said first and second antennas on the basis of the measured signal quality values.

2. The communication system of claim 1, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

3. The communication system of claim 1, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

4. The communication system of claim 1, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

5. The communication system of claim 1, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

6. The communication system of claim 5, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

7. The communication system of claim 5, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

8. The communication system of claim 1, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

9. The communication system of claim 8, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

10. The communication system of claim 9, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

11. The communication system of claim 9, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

12. The communication system of claim 1, the spreading code comprising an eleven-chip Barker code.

13. A communication system for communicating data packets, including a receiver subsystem, the receiver subsystem comprising:

N_A antennas, N_A being at least 2;

a signal-to-noise ratio measurement device in communication with each of the N_A antennas, the device being configured to measure signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

a direct sequence spread-spectrum demodulator in communication with each of the N_A antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device in communication with each of the N_A antennas, the signal quality measurement device being configured to measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code; and

an antenna selection device,

wherein the antenna selection device selects:

a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

14. The communication system of claim 13, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{\left| y_{peak} \right|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

15. The communication system of claim 13, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being

determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

16. The communication system of claim 13, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

17. The communication system of claim 13, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

18. The communication system of claim 17, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

19. The communication system of claim 17, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

20. The communication system of claim 13, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

21. The communication system of claim 20, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

22. The communication system of claim 21, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

23. The communication system of claim 21, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices $k = p-i$ and $k = p+i$ for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

24. The communication system of claim 13, the spreading code comprising an eleven-chip Barker code.

25. The communication system of claim 13, wherein $N_A = 2$.

26. A communication system for communicating data packets, including a receiver subsystem, the receiver subsystem comprising:

N_A antennas, N_A being at least 2;

a signal-to-noise ratio measurement device in communication with each of the N_A antennas, the device being configured to measure signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios of each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

a direct sequence spread-spectrum demodulator in communication with each of the N_A antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device in communication with each of the N_A antennas, the signal quality measurement device being configured to measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the

spreading code, wherein an r^{th} antenna of the n^{th} and M_A antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

an antenna selection device,

wherein the antenna selection device selects:

the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

27. The communication system of claim 26, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

28. The communication system of claim 26, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being

determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

29. The communication system of claim 26, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

30. The communication system of claim 26, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

31. The communication system of claim 30, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

32. The communication system of claim 30, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

33. The communication system of claim 26, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

34. The communication system of claim 33, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

35. The communication system of claim 34, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

36. The communication system of claim 34, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices $k = p-i$ and $k = p+i$ for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

37. The communication system of claim 26, the spreading code comprising an eleven-chip Barker code.

38. The communication system of claim 26, wherein $N_A = 2$.

39. A communication system for communicating data via a first antenna and a second antenna, the system being configured to receive data packets, and the system comprising:

a direct sequence spread-spectrum demodulator in communication with the first and second antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device responsive to the direct sequence spread-spectrum demodulator, the signal quality measurement device being configured to measure signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code and to select one of said first and second antennas on the basis of the measured signal quality values.

40. The communication system of claim 39, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{\left| y_{peak} \right|}{\left| \sum_{i=0}^{N} y_i - 2 y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

41. The communication system of claim 39, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

42. The communication system of claim 39, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

43. The communication system of claim 39, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

44. The communication system of claim 43, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

45. The communication system of claim 43, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

46. The communication system of claim 39, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

47. The communication system of claim 46, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

48. The communication system of claim 47, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

49. The communication system of claim 47, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

50. The communication system of claim 39, the spreading code comprising an eleven-chip Barker code.

51. A communication system for communicating data via N_A antennas, N_A being at least 2, the system being configured to receive data packets, and the system comprising:

a signal-to-noise ratio measurement device in communication with each of the N_A antennas, the device being configured to measure signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

a direct sequence spread-spectrum demodulator in communication with each of the N_A antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device in communication with each of the N_A antennas, the signal quality measurement device being configured to measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code; and

an antenna selection device,

wherein the antenna selection device selects:

a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

52. The communication system of claim 51, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the

maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

53. The communication system of claim 51, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

54. The communication system of claim 51, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

55. The communication system of claim 51, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

56. The communication system of claim 55, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

57. The communication system of claim 55, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

58. The communication system of claim 51, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

59. The communication system of claim 58, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

60. The communication system of claim 59, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

61. The communication system of claim 59, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

62. The communication system of claim 51, the spreading code comprising an eleven-chip Barker code.

63. The communication system of claim 51, wherein $N_A = 2$.

64. A communication system for communicating data via N_A antennas, N_A being at least 2, the system being configured to receive data packets, and the system comprising:

a signal-to-noise ratio measurement device in communication with each of the N_A antennas, the device being configured to measure signal-to-noise ratios corresponding to each of

the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the signal to noise ratios of each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

a direct sequence spread-spectrum demodulator in communication with each of the N_A antennas, the demodulator being configured to correlate a spreading code with a preamble of each data packet to produce a spreading codeword, and the spreading code including a predetermined number of chips; and

a signal quality measurement device in communication with each of the N_A antennas, the signal quality measurement device being configured to measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, wherein an r^{th} antenna of the n^{th} and M_A antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

an antenna selection device,

wherein the antenna selection device selects:

the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

65. The communication system of claim 64, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

66. The communication system of claim 64, further comprising

an analog-to-digital converter, the analog-to-digital converter being in communication with each of the first and second antennas and with the demodulator, and the analog-to-digital converter being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

67. The communication system of claim 64, wherein the signal quality measurement device computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

68. The communication system of claim 64, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

69. The communication system of claim 68, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

70. The communication system of claim 68, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

71. The communication system of claim 64, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

72. The communication system of claim 71, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

73. The communication system of claim 72, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

74. The communication system of claim 72, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

75. The communication system of claim 64, the spreading code comprising an eleven-chip Barker code.

76. The communication system of claim 64, wherein $N_A = 2$.

77. An apparatus for communicating data packets, the apparatus comprising:

first antenna receiving means for receiving data packets via a first antenna in an antenna diversity array;

second antenna receiving means for receiving data packets via a second antenna in the antenna diversity array;

spreading means for correlating a preamble of a received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the first and second antenna receiving means, and the spreading code including a predetermined number of chips;

measuring means for measuring signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code; and

selecting means for selecting an antenna from the antenna diversity array on the basis of the measured signal quality values.

78. The apparatus of claim 77, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

79. The apparatus of claim 77, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

80. The apparatus of claim 77, wherein the measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

81. The apparatus of claim 77, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

82. The apparatus of claim 81, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

83. The apparatus of claim 81, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

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the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

84. The apparatus of claim 77, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

85. The apparatus of claim 84, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

86. The apparatus of claim 85, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

87. The apparatus of claim 85, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices $k = p-i$ and $k = p+i$ for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

88. The apparatus of claim 77, the spreading code comprising an eleven-chip Barker code.

89. An apparatus for communicating data packets, the apparatus comprising:

N_A antenna receiving means for receiving data packets via N_A antennas in an antenna diversity array, N_A being at least 2;

signal-to-noise ratio measuring means for measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, the signal-to-noise ratio measuring means being in communication with each of the N_A antennas, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

spreading means for correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the N_A antennas, and the spreading code including a predetermined number of chips;

signal quality measuring means for measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, the signal quality measuring means being in communication with each of the N_A antennas; and

antenna selecting means for selecting an antenna,

wherein the antenna selecting means is configured to:

select a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

select the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

90. The apparatus of claim 89, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

91. The apparatus of claim 89, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

92. The apparatus of claim 89, wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

93. The apparatus of claim 89, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

94. The apparatus of claim 93, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

95. The apparatus of claim 93, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

96. The apparatus of claim 89, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

97. The apparatus of claim 96, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

98. The apparatus of claim 97, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

99. The apparatus of claim 97, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

100. The apparatus of claim 89, the spreading code comprising an eleven-chip Barker code.

101. The apparatus of claim 89, wherein $N_A = 2$.

102. An apparatus for communicating data packets, the apparatus comprising:

N_A antenna receiving means for receiving data packets via N_A antennas in an antenna diversity array, N_A being at least 2;

signal-to-noise ratio measuring means for measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, the signal-to-noise ratio measuring means being in communication with each of the N_A antennas, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

spreading means for correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the N_A antennas, and the spreading code including a predetermined number of chips;

signal quality measuring means for measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, the signal quality measuring means being in communication with each of the N_A antennas, wherein an r^{th} antenna of the n^{th} and M_A antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

antenna selecting means for selecting an antenna, wherein the antenna selecting means is configured to:

select the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

select the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

103. The apparatus of claim 102, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{\left| y_{peak} \right|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

104. The apparatus of claim 102, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

105. The apparatus of claim 102, wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

106. The apparatus of claim 102, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

107. The apparatus of claim 106, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

108. The apparatus of claim 106, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

109. The apparatus of claim 102, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

110. The apparatus of claim 109, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

111. The apparatus of claim 110, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

112. The apparatus of claim 110, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

113. The apparatus of claim 102, the spreading code comprising an eleven-chip Barker code.

114. The apparatus of claim 102, wherein $N_A = 2$.

115. An apparatus for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including at least a first antenna and a second antenna, and the apparatus comprising:

spreading means for correlating a preamble of a received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the first and second antenna receiving means, and the spreading code including a predetermined number of chips;

measuring means for measuring signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code; and

selecting means for selecting an antenna from the antenna diversity array on the basis of the measured signal quality values.

116. The apparatus of claim 115, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

117. The apparatus of claim 115, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

118. The apparatus of claim 115, wherein the measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

119. The apparatus of claim 115, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

120. The apparatus of claim 119, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

121. The apparatus of claim 119, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

122. The apparatus of claim 115, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

123. The apparatus of claim 122, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

124. The apparatus of claim 123, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

125. The apparatus of claim 123, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

126. The apparatus of claim 115, the spreading code comprising an eleven-chip Barker code.

127. An apparatus for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, and the apparatus comprising:

signal-to-noise ratio measuring means for measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, the signal-to-noise ratio measuring means being in communication with each of the N_A antennas, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

spreading means for correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the N_A antennas, and the spreading code including a predetermined number of chips;

signal quality measuring means for measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, the signal quality measuring means being in communication with each of the N_A antennas; and

antenna selecting means for selecting an antenna,

wherein the antenna selecting means is configured to:

select a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

select the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

128. The apparatus of claim 127, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{\left| y_{peak} \right|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right).$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

129. The apparatus of claim 127, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

130. The apparatus of claim 127, wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

131. The apparatus of claim 127, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

132. The apparatus of claim 131, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

133. The apparatus of claim 131, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

134. The apparatus of claim 127, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

135. The apparatus of claim 134, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

136. The apparatus of claim 135, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

137. The apparatus of claim 135, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

138. The apparatus of claim 127, the spreading code comprising an eleven-chip Barker code.

139. The apparatus of claim 127, wherein $N_A = 2$.

140. An apparatus for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, and the apparatus comprising:

signal-to-noise ratio measuring means for measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, the signal-to-noise ratio measuring means being in communication with each of the N_A antennas, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

spreading means for correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading means being in communication with each of the N_A antennas, and the spreading code including a predetermined number of chips;

signal quality measuring means for measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, the signal quality measuring means being in communication with each of the N_A antennas, wherein an r^{th} antenna of the n^{th} and M_A antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

antenna selecting means for selecting an antenna, wherein the antenna selecting means is configured to:

select the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

select the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

141. The apparatus of claim 140, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

142. The apparatus of claim 140, further comprising

digitizing means for converting an analog signal to a set of digitized samples, the digitizing means being in communication with each of the first and second antenna receiving means and with the spreading means, and the digitizing means being configured to extract a predetermined number of sample values for each spreading codeword, and

wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

143. The apparatus of claim 140, wherein the signal quality measuring means computes peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

144. The apparatus of claim 140, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

145. The apparatus of claim 144, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

146. The apparatus of claim 144, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

147. The apparatus of claim 140, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

148. The apparatus of claim 147, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

149. The apparatus of claim 148, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

150. The apparatus of claim 148, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

151. The apparatus of claim 140, the spreading code comprising an eleven-chip Barker code.

152. The apparatus of claim 140, wherein $N_A = 2$.

153. A method of selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including at least a first antenna and a second antenna, and the method comprising the steps of:

correlating a preamble of a received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measuring signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code; and

selecting an antenna from the antenna diversity array on the basis of the measured signal quality values.

154. The method of claim 153, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

155. The method of claim 153, further comprising the step of

converting an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the step of measuring further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

156. The method of claim 153, wherein the step of measuring further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample

values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

157. The method of claim 153, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

158. The method of claim 157, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

159. The method of claim 157, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

160. The method of claim 153, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

161. The method of claim 160, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

162. The method of claim 161, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

163. The method of claim 161, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

164. The method of claim 153, the spreading code comprising an eleven-chip Barker code.

165. A method of selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, and the method comprising the steps of:

measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code; and

selecting an antenna,

wherein the step of selecting includes the steps of:

selecting a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

selecting the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

166. The method of claim 165, wherein the signal quality values are computed as follows:

$$SQ_J = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the

maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

167. The method of claim 165, further comprising the step of

converting an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the step of measuring signal quality values further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

168. The method of claim 165, wherein the step of measuring signal quality values further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

169. The method of claim 165, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

170. The method of claim 169, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

171. The method of claim 169, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

172. The method of claim 165, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

173. The method of claim 172, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

174. The method of claim 173, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

175. The method of claim 173, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices $k = p-i$ and $k = p+i$ for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

176. The method of claim 165, the spreading code comprising an eleven-chip Barker code.

177. The method of claim 165, wherein $N_A = 2$.

178. A method of selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, and the method comprising the steps of:

measuring signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

correlating a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measuring signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, wherein an r^{th} antenna of the n^{th} and M_A

antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

selecting an antenna, wherein the step of selecting includes the steps of:

selecting the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

selecting the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

179. The method of claim 178, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

180. The method of claim 178, further comprising the step of

converting an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the step of measuring signal quality values further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

181. The method of claim 178, wherein the step of measuring signal quality values further comprises computing peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

182. The method of claim 178, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

183. The method of claim 182, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

184. The method of claim 182, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

185. The method of claim 178, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

186. The method of claim 185, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

187. The method of claim 186, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

188. The method of claim 186, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

189. The method of claim 178, the spreading code comprising an eleven-chip Barker code.

190. The method of claim 178, wherein $N_A = 2$.

191. A storage medium for storing software for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including at least a first antenna and a second antenna, the software being computer-readable, wherein the software includes instructions for causing a computer to:

correlate a preamble of a received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measure signal quality values corresponding to each of the first and second antennas for each data packet after correlation with the spreading code; and

select an antenna from the antenna diversity array on the basis of the measured signal quality values.

192. The storage medium of claim 191, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

193. The storage medium of claim 191, the software further including instructions for causing a computer to

convert an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the instructions for causing a computer to measure further comprise instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

194. The storage medium of claim 191, wherein the instructions for causing a computer to measure further comprise instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

195. The storage medium of claim 191, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

196. The storage medium of claim 195, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

197. The storage medium of claim 195, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

198. The storage medium of claim 191, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

199. The storage medium of claim 198, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

200. The storage medium of claim 199, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

201. The storage medium of claim 199, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices $k = p-i$ and $k = p+i$ for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

202. The storage medium of claim 191, the spreading code comprising an eleven-chip Barker code.

203. A storage medium for storing software for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, the software being computer-readable, wherein the software includes instructions for causing a computer to:

measure signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a threshold, wherein M_A is 0 to N_A-1;

correlate a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code; and

select an antenna,

wherein the instructions for causing a computer to select an antenna include instructions for causing a computer to:

select a q^{th} one of the M_A antennas having a maximum signal quality value when M_A is greater than 0 and the signal quality value corresponding to the q^{th} one of the M_A antennas is greater than the signal quality value corresponding to the n^{th} antenna; and

select the n^{th} antenna when $M_A = 0$ or when the signal quality value of n^{th} antenna is greater than the maximum signal quality value for all of the M_A antennas in the group.

204. The storage medium of claim 203, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

205. The storage medium of claim 203, the software further including instructions for causing a computer to

convert an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the instructions for causing a computer to measure signal quality values further include instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

206. The storage medium of claim 203, wherein the instructions for causing a computer to measure signal quality values further include instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

207. The storage medium of claim 203, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

208. The storage medium of claim 207, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

209. The storage medium of claim 207, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

210. The storage medium of claim 203, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

211. The storage medium of claim 210, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

212. The storage medium of claim 211, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

213. The storage medium of claim 211, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

214. The storage medium of claim 203, the spreading code comprising an eleven-chip Barker code.

215. The storage medium of claim 203, wherein $N_A = 2$.

216. A storage medium for storing software for selecting an antenna from an antenna diversity array in a communication system, the communication system being configured to receive data packets, the antenna diversity array including N_A antennas, N_A being at least 2, the software being computer-readable, wherein the software includes instructions for causing a computer to:

measure signal-to-noise ratios corresponding to each of the N_A antennas for each data packet, wherein an n^{th} one of the N_A antennas corresponds to a maximum signal to noise ratio of the N_A antennas, and a group comprises M_A of the N_A antennas such that a difference between the magnitudes of the signal to noise ratios corresponding to each one of the M_A antennas and the n^{th} antenna is less than a first threshold, wherein M_A is 0 to N_A-1;

correlate a preamble of each received data packet with a direct sequence spread-spectrum type spreading code to produce a spreading codeword, the spreading code including a predetermined number of chips;

measure signal quality values corresponding to each of the N_A antennas for each data packet after correlation with the spreading code, wherein an r^{th} antenna of the n^{th} and M_A antennas corresponds to a maximum signal quality value of the n^{th} and M_A antennas and a p^{th} antenna of the n^{th} and M_A antennas has a second highest signal quality value of the n^{th} and M_A antennas; and

selecting an antenna, wherein the instructions for causing a computer to select an antenna include instructions for causing a computer to:

select the r^{th} antenna when M_A is greater than 0 and the magnitude of a difference between the signal quality value of the r^{th} antenna and the p^{th} antenna is greater than a second threshold; and

select the n^{th} antenna when $M_A = 0$ or M_A is at least one and the magnitude of the difference between the signal quality values of the r^{th} antenna and the p^{th} antenna is less than the second threshold.

217. The storage medium of claim 216, wherein the signal quality values are computed as follows:

$$SQ_j = \left(\frac{|y_{peak}|}{\left| \sum_{i=0}^{N} y_i - 2y_{peak} \right|} \right)$$

where N is a predetermined number of samples to be extracted for each spreading codeword, y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_{peak} is the maximum of all values of y_k for symbol y, and SQ_j = the signal quality measurement for the j^{th} antenna.

218. The storage medium of claim 216, the software further including instructions for causing a computer to

convert an analog signal to a set of digitized samples by extracting a predetermined number of sample values from each spreading codeword, and

wherein the instructions for causing a computer to measure signal quality values further includes instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

219. The storage medium of claim 216, wherein the instructions for causing a computer to measure signal quality values further includes instructions for causing a computer to compute peak-to-average ratio values by dividing a peak sample value by an average sample value, the average sample value being determined by averaging all of the predetermined number of sample values for each spreading codeword, and the peak sample value being determined by selecting the maximum of all of the predetermined number of sample values for each spreading codeword.

220. The storage medium of claim 216, wherein a predetermined number of sample values for each spreading codeword is equal to the predetermined number of chips in the spreading code.

221. The storage medium of claim 220, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_k for symbol y, L and M are arbitrary whole numbers, N is the number of samples, and for any index k, $y_k = y_{k \bmod N}$, and SQ = the signal quality measurement.

222. The storage medium of claim 220, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the N sample values for each spreading codeword, wherein k is computed using modulo-N arithmetic;

the peak sample value is determined by selecting a maximum of all of the N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

223. The storage medium of claim 216, wherein a predetermined number of sample values for each spreading codeword is greater than the predetermined number of chips in the spreading code.

224. The storage medium of claim 223, wherein the predetermined number of sample values is double the predetermined number of chips in the spreading code.

225. The storage medium of claim 224, wherein the signal quality values are computed as follows:

$$SQ = \left(\frac{|y_p|}{\sum_{i=1}^{L} \left(|y_{p-M-i}| + |y_{p+M+i}| \right)} \right)$$

where y_k is a value corresponding to the k^{th} sample for spreading codeword symbol y, y_p is the maximum of all values of y_i for symbol y, L and M are arbitrary whole numbers, 2N is the number of samples, and for any index k, $y_k = y_{k \bmod 2N}$, and SQ = the signal quality measurement.

226. The storage medium of claim 224, the signal quality values being computed by dividing a peak sample value by an average sample value, wherein

2N is the predetermined number of sample values for each spreading codeword;

an index k corresponds to the k^{th} sample within a chronological sequence of all of the 2N sample values for each spreading codeword, wherein k is computed using modulo-2N arithmetic;

the peak sample value is determined by selecting a maximum of all of the 2N sample values for each spreading codeword;

an index p indicates the sample corresponding to the peak sample value;

a value corresponding to a symmetric pair of samples is determined by adding values corresponding to the samples having indices k = p-i and k = p+i for a differential index i; and

the average sample value is determined by adding together an arbitrary number of values corresponding to symmetric pairs of samples.

227. The storage medium of claim 216, the spreading code comprising an eleven-chip Barker code.

228. The storage medium of claim 216, wherein $N_A = 2$.